# Denali Road Capacity Study

Denali National Park and Preserve

National Park Service

U.S. Department of the Interior

## *Summer 2007- July Update*

The Denali Park road has very unique traffic patterns affected by a number of factors such as locations of wildlife sightings; numbers, behavior and type of buses on the road each day; weather; and road maintenance. To account for the affects of these various factors on traffic flow, researchers will use GPS, wildlife sighting, and stop data collected from vehicles driving the park road in 2006/2007 to create a traffic model capable of simulating vehicle driving behaviors. The model enables researchers to vary bus schedule scenarios, wildlife encounter probabilities and other road logistic rules to quantify predicted bunching, travel times, and following distances of vehicles on the road. The results will be combined with results from wildlife and visitor experience studies to determine the carrying capacity of the park road. Management rules for vehicle behavior will be created using indicators from wildlife and visitor survey study. Traffic volumes will then be experimentally increased within simulation model and measurements of traffic congestion calculated given specified management rules.

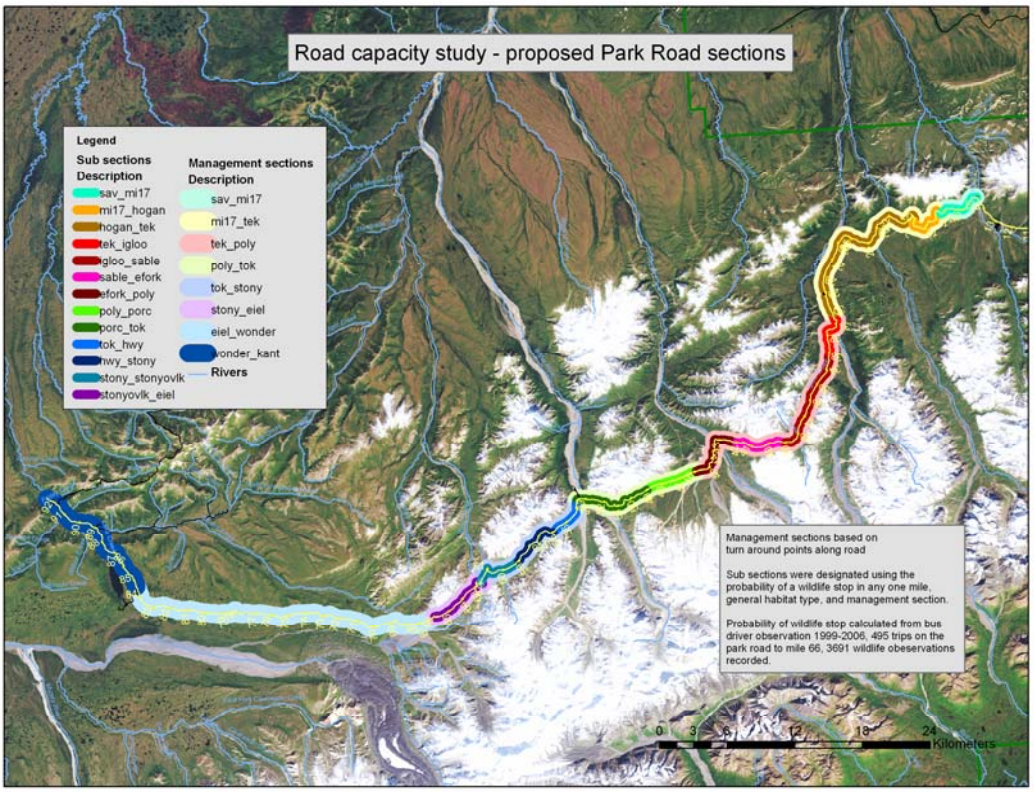


*Figure 1. Proposed sections of park road for use in the Denali park road capacity model.*

When modeling various vehicle management scenarios in the traffic simulation model, we will implement scenarios and view results by road section as well as across the entire park road. The preliminary map of sections to be used in the traffic model contains 8 management sections based on turnaround points along the road and 13 sub sections (Fig. 1). The sub sections were outlined by analyzing wildlife observation data collected by volunteer bus drivers between 1999 – 2006. We used 3,691 wildlife observations from 495 bus trips on the to mile 66 on the Denali park road in the analysis to determine the probability of stopping for a wildlife sighting within mile segments of the park road (Fig. 2). We then compared those results to broad habitat characteristics to decide on the final boundaries of segments.

### *SLCD panels*

As part of the NPS road capacity study, we are asking bus drivers to collect information about all stops they make along the Denali Park road by entering data into SLCD touch screen panels that will be mounted in 20 VTS and Tour buses. The data entered into the panels will be tied to GPS location information and downloaded by remote base stations. Wildlife and visitor drop off and pick up location data collected from the panels will be used to create a model of the probability of wildlife citings and visitor stops along the road that will be incorporated into the traffic model. This probability data will be entered into the model using the sections outlined above. Other stop data will be used to accurately model vehicle stop behavior on the park road. This panel data is a critical piece of information necessary to create a realistic and viable model of vehicle behavior on the park road.

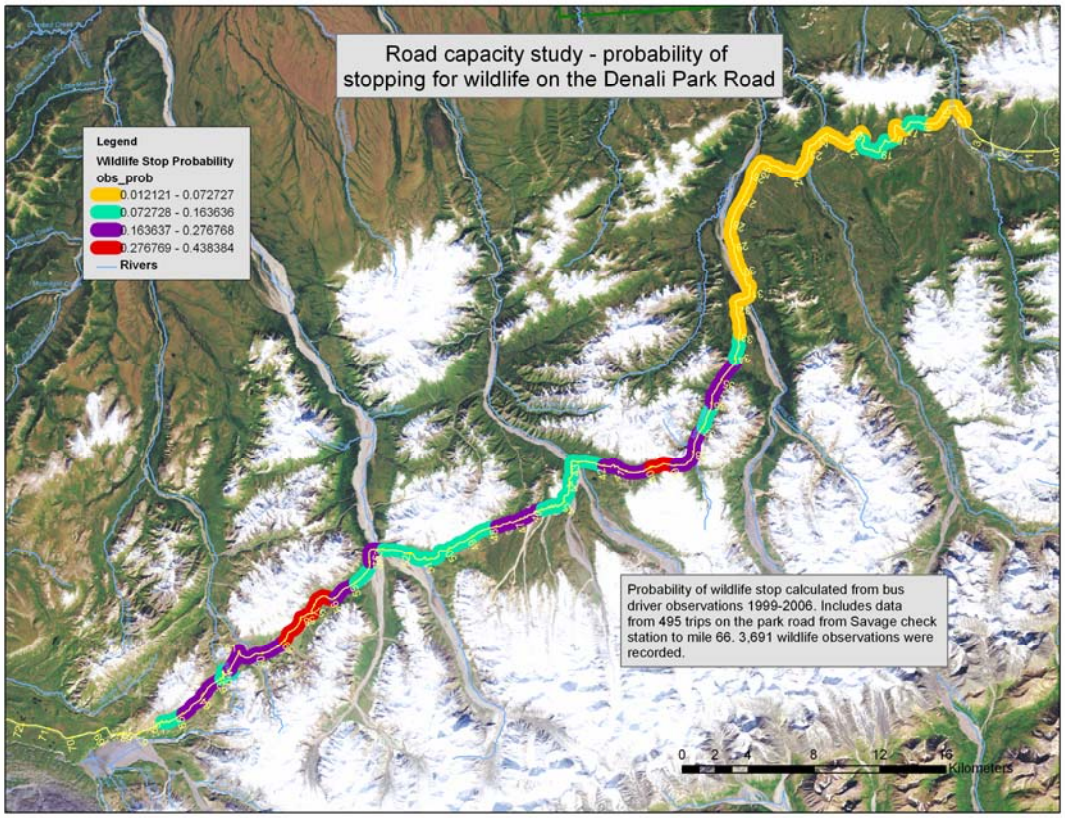


*Figure 2. Probability of viewing wildlife along the Denali Park Road calculated from bus driver observations 1999-2006.*

### *Current events*

Current road study work in the park includes: written quantitative visitor surveys conducted by University of Vermont staff (final survey available on road study website); Dall sheep behavioral observations; road dust collection and monitoring (may notice green collection bins at 5 locations along road); vehicle GPS download and maintenance; hand-held GPS distribution at Savage check station; Sunday "Quiet" night; traffic counter data collection; and 2006 bear habitat use data analysis.

***Contact Laura Phillips at laura_phillips@nps.gov or 683-5761 with comments or suggestions. For more information on the road capacity study, visit the website at: http://www.nps.gov/dena/naturescience/denali-park-road-capacity-study.htm.***

*Thanks!*